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ABSTRACT

The paper provides an overview of a data based physical education program for the severely handicapped which has been developed at Oregon State University's Department of Physical Education in cooperation with the Special Education Department of Teaching Research. Concepts which form the basis of the model include that there is no way of determining the extent to which a student will progress (therefore, no ceiling is placed on the curriculum) and that because of the range of individual abilities among the handicapped all materials must be individually sequenced. The basic learning approach is behavior modification involving cues, the student's behavior, and consequences or reinforcers. A special "Game, Exercise, and Leisure Sport Curriculum" developed to meet the physical education needs of the severely handicapped has sections on the following skill areas: movement concepts, skills found in popular elementary games, physical fitness skills, and popular lifetime leisure skills. The curriculum consists of a series of behavior analyses (task analyses) of basic physical education skills. The instructional team includes a physical or special educator (familiar with the student's movement needs, the student's reinforcement schedule, and language capabilities) and parents (who serve to maintan skills learned in the curriculum through home instruction). A clipboard is established for each student which contains the weekly cover sheet (specifying all programs in which the student is engaged), the consequence list of things that are reinforcing to the student, a language sheet on the level of the student's language complexity, a behavioral sequence sheet, a program cover sheet, and a data sheet. Inservice training to implement the data based system covers specific objectives such as ability to conduct prescriptive physical education programs and knowledge of behavior management and behavioral terminology. An example of one skill (the underhand roll) from the curriculum is outlined. (SW)

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DATA BASED PHYSICAL EDUCATION FOR THE SEVERELY HANDICAPPED

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Educators have long recognized that the motor development needs of the severely handicapped require specially designed physical activity programs. Unfortunately, however, little information has been presented to assist teachers respond to the unique behavior and motor patterns of students with severe mental, emotional, and sensory impairments. The lack of appropriate educational programs was clearly emphasized with the passage of the Education for All Handicapped Children Act of 1975, Public Law 94-142 (5). This law emphasizes that special education programs, including physical education experiences, must be available for all handicapped children, including the severely handicapped.

Oregon State University's Department of Physical Education in cooperation with the Special Education Department of Teaching Research has developed through the past five years a data based physical education program for the severely handicapped (2). Through Federal funds supplied by the United States Office of Special Education, a special curriculum and instructional process have been developed to teach physical education to the severely handicapped. A unique inservice training program has also been developed to assist teachers implement the data based system within their own school system (1).

The purpose of this paper is to provide a general overview of the instructional system utilized and the materials which have been developed. Within this paper, sections on the philosophical basis of the model used, as well as elements found in the model, will be presented. A discussion of the inservice training system employed will also be described.

PHILOSOPHY OF THE MODEL

The design of the Oregon State University data based model was developed through extensive field testing with severely handicapped students enrolled in the National Model Program for Severely Handicapped Children conducted by Teaching Research in Monmouth, Oregon. Concepts which form the foundation of the model include the following:

(1) Every student, regardless of handicapping condition, can learn. If a student is not learning, the fault lies not with the student but with the educational setting. Students will learn at their maximum rate or potential if the teacher has identified and utilized the correct combination of environmental factors. If the student is not learning, the teacher must experiment by modifying either the cue or consequence or by reducing the behaviors desired to smaller steps (task analysis) so that the student is able to achieve. These modifications to the environment must be done systematically. The data which result from the student's attempt to perform the desired task should be carefully recorded so that an analysis of effects produced by the various changes in cue, behavior, and consequence can be made.

(2) Handicapped students learn in accordance with the same learning principles as normal students, only usually slower. Because handicapped students learn more slowly than a normal student, they require more extensive and intensive education to compensate for their slower learning rates. This implies a longer period spent on education activities, but because it is generally impossible to extend the time of the school day, the extended period of education must be implemented in after school activity with the parents assuming responsibility of conducting part of the instruction.

(3) There is no way of determining the extent to which a student will progress. Therefore, no ceiling is placed on the curriculum; the

teacher must be prepared to take the student as far and as fast as one can go. Thus, the curriculum extends from very basic skills such as executing various body actions while standing, to more advanced game skills such as catching and throwing.

(4) Because the range of individual abilities among a handicapped population is usually greater than the range of abilities among a non-handicapped population, the physical education teacher of the severely handicapped must conduct individualized programs. All materials must be sequenced to meet the wide range of individual needs.

(5) Because of the wide range of individual differences in the severely handicapped population and oftentimes their unmanageability due to previous ineffective training, effective instruction can oftentimes only be achieved in an one-to-one relationship. Therefore, the utilization of trained volunteers to provide individualized instruction in the gymnasium is considered mandatory.

(6) Physical education is an integral component of the educational curriculum for severely handicapped students. As an important area, it is essential, therefore, that physical education curricular materials adhere to the same standards expected of other academic areas. Instructional programs should be sequenced, task analyzed, and data based so that performance changes in physical education skills can be determined.

ELEMENTS OF THE DATA BASED MODEL

In the Oregon State University (OSU) Data Based System there are certain elements which are essential components of the instructional model. These address such critical areas as the methods used to present information, reinforcement procedures, curriculum material, management approaches, and personnel needed. In the following paragraphs, some of the ingredients which comprise the OSU Data Based System for severely

handicapped students will be discussed.

Learning Approach

The basic approach which underlies many effective instructional programs for the moderately and severely handicapped is known as behavior modification. The essence of this approach is that the instructor systematically makes maximum and efficient use of the environment to assist a student in learning a behavior or to assist a student in extinguishing an undesirable behavior.

The foundation of behavior modification has three essential elements: (1) the stimulus, also known as the cue which is the instruction or material presented to the student; (2) the behavior, or the task which the student is to learn or do; and (3) the consequence, or the feedback that the student receives after responding. These elements will be examined repeatedly in relation to their use in the OSU Data Based System.

Cue. The cue is the sign, signal, request, or information that calls for the occurrence of a behavior. It is synonymous to the instructions or materials presented to the student. Cues are those things in the environment that "set the occasion" for the student to behave. For instance, "Come to me, Johnny" is a cue for the student to respond to verbal instructions and to move toward the teacher. The presentation of a ball which the student is to throw is a cue. Thus, a cue can take the form of any instructional materials, verbal, printed or gestural, that are presented to a student. The concept of cue includes all the verbal instructions by the teacher. It includes the gestures of the teacher as well as the way in which objects or materials are presented.

Behavior. The second major element of this approach is behavior. Behavior is anything which a person does. It includes lifting a little finger, blinking an eye, kicking a ball, or climbing a rope. In the

teaching of students, a behavior is a particular task which the student is to learn. Behavior can be something as simple as having the student extend his arms or as complex as having the student bat a pitched ball.

When teaching a behavior, however, the teacher should constantly keep in mind that most behaviors can be divided into smaller behaviors or pieces of behavior. It is these pieces of behavior which make up the teaching sequence. Take, for instance, batting a pitched ball. Batting a ball is called a terminal behavior. Yet, it is comprised of a number of small behaviors -- placing each foot in the proper position, grasping the bat with the left hand and the right hand, putting the bat back over the shoulder, fixing the eyes on the pitcher, then following with the eyes the pitched ball and so on, step by step, through the procedure until the ball is batted. The smaller or less difficult behaviors are called "enabling" behaviors. The learning of them enables the student to learn the terminal behavior.

This process of breaking down a terminal behavior into the enabling behaviors is called analysis of behavior. The physical education teacher is taught to analyze behavior -- to break down the behavior to minute sequences and to teach each part as though it were a separate and distinct behavior to be learned. With each new part that is learned, the student must be taught to chain the parts together so they form a smooth flowing larger terminal behavior.

Consequences. Consequences are the third major element of concern. Consequences can be likened to a feedback system. After the student performs a particular behavior, feedback or a consequence for that performance is provided. This consequence tells the student that what he did was correct or incorrect. In a school setting, one might think of the student taking a motor fitness test, and having the test score interpreted as a consequence of the way the individual performed. The

consequence can either be pleasing or displeasing to the person receiving it. A consequence that is pleasing to a person is called a reinforcer; a consequence that is displeasing is called a punisher. The basic concept underlying the delivery of consequences is that the reinforcers delivered following a behavior increase the probability of the behavior occurring again; punishers delivered following a behavior decrease that probability.

A reinforcer must be pleasurable to the person experiencing it. Because it is pleasurable, and because the person desires that pleasure and associates a particular behavior with the receipt of the reinforcer, a reinforcer by definition increases the probability of a behavior reoccurring. The student who enjoys social praise may increase the quality or quantity of his performance after being told, "You're doing a nice job!" Consequently, reinforcers by definition must be individualized because what is pleasing and, therefore, reinforcing to one person may not be pleasing and reinforcing to another. The principle of individualization also applies to punishers. A verbal reprimand may be severely punishing (displeasing) to one student whereas another student may not perceive that same reprimand as punishing. Therefore, punishers, like reinforcers, must be individualized.

A basic rule in the use of consequences is to rely, if at all possible, on the natural consequences of the environment. Fortunately, in the physical education environment there are many activities and experiences which in themselves are reinforcing, e.g. watching the movement of a ball after it is pushed. For some, however, the natural consequences of the environment are not sufficient and it may be necessary to identify other types of reinforcers which are foreign or artificial to indicate to the student that his behavior is acceptable.

Game, Exercise, and Leisure Sport Curriculum

In response to the physical education needs of the severely handicapped, a special Game, Exercise, and Leisure Sport Curriculum (3) was developed and implemented in 1977. Recent efforts have focused on field testing the curriculum to determine its appropriateness. The present revision has been found effective as a guide for teaching severely handicapped students basic physical education skills.

The curriculum is divided into four sections. The first section, Movement Concepts, deals with movement through space in one's immediate personal environment to movement skills in more complex environments. Section two includes skills found in many of our popular elementary games. Physical fitness skills essential for survival in modern society are included in section three. The last section focuses on some popular lifetime leisure skills. It is believed that this curriculum provides a bridge between therapeutically oriented motor programs and the more advanced physical education experiences which include highly organized game, sport, and physical fitness skills. The ultimate goal is to equip severely handicapped students with essential prerequisite skills to enable them to use these skills in more normal settings. The OSU/Teaching Research curriculum is systematic, data based, and consistent with the definition of physical education in Public Law 94-142 (5:42480). Unfortunately, in the area of physical education, there are very few curricula which are specifically designed for the severely handicapped (4), and those which have been reported are either geared too high or are entirely therapeutic in nature.

The Game, Exercise, and Leisure Sport Curriculum consists of a series of behavior analyses (task analyses) of basic physical education skills. The entire concept of task analysis is based on the observation that for

a student to learn a complex skill, it may be necessary to break down that complex skill into more simple skills and to teach each of those simple skills separately. This curriculum is designed to be used in a program where individual objectives are designed for each student. It must be emphasized, however, that no curriculum can provide all the needed sequences and task analyses for any particular student. The responsibility for altering the sequences to fit the student's needs is the responsibility of the teacher. It is felt, however, that given this curriculum and the skills to make the alterations as necessary, that the teacher can provide appropriate physical activity experiences for handicapped students.

Personnel

As is true with any educational system, the skill of the personnel involved in the program frequently determines the quality of the program. This basic concept is true as it applies to the OSU Data Based System.

The person responsible for teaching physical education to the severely handicapped in the United States varies from school district to school district and from state to state. The options usually include one or two persons -- the special educator or the physical educator. According to the Rules and Regulations for Public Law 94-142 (5), it could be argued that technically either person is qualified. However, if the local school district has physical educators available to instruct non-handicapped students, it would seem logical that these personnel should be available to instruct handicapped students. In the eventuality that a physical educator is available to teach physical education to the severely handicapped, it is essential that this person articulate closely with the special education teacher. In short, it is necessary for the physical educator to understand not only the student's movement needs,

but also basic information such as the student's reinforcement schedule and language capabilities.

The teacher of physical education for the severely handicapped must assume a role as manager of the learning environment. Students with major disabilities require educational settings in which they are instructed individually or in small groups. Such an arrangement is possible only if the teacher has personnel who can assist with instruction. Implementation of the OSU Data Based System requires the availability of trained volunteers. It is these individuals who are frequently most responsible for conducting the individual skill acquisition program.

The utilization of parents is also an essential part of the instructional team. Effective instruction can be carried out by parents in the home. Parents can serve not only to maintain skills learned in physical education, but also can actually accelerate learning. Thus, coordination with parents is an important element in enhancing the motor and physical fitness of severely handicapped students. The OSU Data Based System offers a process whereby parents and volunteers are trained to implement programs developed by teachers.

The Clipboard System

All of the elements presented above must be brought together so that they become a cohesive system, facilitating the instructional process of the student. The administrative device that accomplishes this coordination is the clipboard established for each student. The clipboard describes in detail what to do with each student, where to record the information (data), and how to interact with the student. It is the communication channel through which all instruction to volunteers and parents is given and through which feedback comes to the teacher so that the student's individualized program can be modified.

Each student's clipboard contains the weekly cover sheet which specifies all programs, including the physical education programs in which the student is currently engaged. A student may be engaged in as many as five to a dozen programs, e.g. Physical Education (underhand throw); Eating (finger foods); Writing (reproduces cross). The number of programs will be determined by the number of volunteers available to conduct each program.

Immediately following the weekly cover sheet on the clipboard is the consequence list which lists the things that are reinforcing to the student. This list provides the teacher and volunteer the necessary information to choose reinforcers for the student. On the sheet with the consequence list is a section devoted to behavioral comments, which also provides instructions on how to handle behavioral problems that may occur during an instructional period.

The third page on the clipboard is the language sheet. The language sheet is divided into three parts: (1) receptive language; (2) expressive language; and (3) new vocabulary. The receptive language section defines the degree of understanding which the student has of spoken language. The expressive language section describes the degree of language complexity which the student is able to emit.

The new vocabulary sections include new words or sounds which the student has acquired that need to be reinforced. In all programs, including physical education, the consequence and language sheet must be used by all teachers, aides, and volunteers. Whether in the gymnasium or in the classroom, consistency in behavior treatment and communication procedures is essential for successful programming.

Following the language sheet are three sheets (a behavioral sequence sheet, a program cover sheet, and a data sheet) for each program listed on the weekly cover sheet. The behavioral sequence sheet (Figure 1)

contains an example of a task analysis of one skill, and the program cover sheet (Figure 2) describes how a sample program is to be run. In Figure 2, a trained volunteer can see what the verbal and non-verbal cue is, the correction procedure, materials to be used, the reinforcement ratio, and the criterion level of success. All this information helps a volunteer determine how a program is to be run. The last form is the data sheet. Taking data assists the teacher review the student's performance so that an informed decision can be made to update the program appropriately for the following day.

TRAINING PERSONNEL IN THE OSU DATA BASED SYSTEM

Since the Fall of 1979 through funds provided by the United States Office of Special Education, Oregon State University in conjunction with Teaching Research has trained school personnel to implement the OSU Data Based System. The format includes an one week intensive inservice training experience with both theoretical presentations and practical applications of the information provided. Follow-up visits are also included in the inservice training model to insure the successful transition of concepts learned to their application in the trainee's own school. Specific objectives of the inservice training experience include:

(1) Demonstrate knowledge of the OSU Data Based System by answering questions over materials and activities presented.

(2) Administer a placement and baseline test to establish appropriate physical education experiences for severely handicapped students.

(3) Conduct prescriptive physical education programs.

(4) Modify and update prescriptive physical education programs based on data collected during teaching session.

(5) Demonstrate the ability to conduct physical education programs with small groups of severely handicapped students.

(6) Demonstrate knowledge of behavior management and behavioral terminology.

(7) Demonstrate ability to use a volunteer observation form to provide feedback to other trainees.

(8) Implement the OSU Data Based System at their own school utilizing the information and skills gained during the one week training.

During the 1980-1981 school year, twenty-eight school personnel were trained. Ninety percent of those trained have maintained the criterion developed during training with the result that 167 severely and moderately handicapped students are now receiving appropriate physical education experiences.

The Oregon State University Data Based System is a continually evolving and dynamic approach to responding to the needs of severely handicapped students. In this paper a brief overview of the Model, some of its elements, and the efforts to train others, have been presented. Additional information related to the intricacies of the system are beyond the scope of this paper. It is hoped, however, that this paper will serve to inform others of the Oregon State University System so that an effective dialogue can be established with others interested in improving and enhancing the motor and physical fitness experiences for handicapped students everywhere.

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GAME SKILLS, BASIC

A. Underhand Roll

Terminal Objective: Student, from a standing position, will perform an underhand roll by swinging the arm backward and then forward while stepping forward simultaneously with the opposite foot and releasing the ball at the end of the swing in the direction of the target.

Prerequisite Skills: Gross Motor, DD; Fine Motor Skills, A and G.

Phase I — Sitting in a chair, swing arm backward and then forward releasing ball.

Phase II — Standing with knees bent, swing arm backward and then forward releasing ball.

Phase III — Standing with one foot forward and one foot back, and knees bent, swing arm backward and then forward releasing ball.

Phase IV — Standing with knees bent, swing arm backward and then forward releasing ball while simultaneously stepping forward with the opposite foot.

Teaching Notes:

1. For those students in wheelchairs, the underhand roll can be performed with the student sitting in the wheelchair, thus eliminating the need for the above prerequisite body positions.

2. For non-ambulatory students who are not in a wheelchair, ball rolling could be taught from a supported sitting position.

3. When students have problems with timing the step and throw, the teacher may choose to physically assist, and/or prompt the foot during the throw.

Suggested Materials: A tennis ball and a 3' x 3' target placed on the floor. Any type or size of ball may be used to facilitate learning.

Figure 1. An example of one skill from the Oregon State University Game, Exercise, and Leisure Sport Curriculum

PUPIL: John Q. DATE STARTED: October 3, 1981 DATE COMPLETED:	PROGRAM: Game Skills, Basic - A. Underhand Roll
SETTING (NON-VERBAL CUE): Establish eye contact with John prior to delivering the cue.	MATERIALS: Clipboard Pencil Chair Ball 3'x 3' target
INSTRUCTIONAL PROCESS: Verbal Cue: John, roll the ball underhand. Model: Demonstrate if the response to the verbal cue is incorrect. Physical Assistance: Provide assistance if the response to the verbal cue and demonstration is incorrect.	CRITERION: Three consecutive responses before moving to the next phase.

Figure 2. Sample Program Cover Sheet